IDAHO CONTENT STANDARDS
PRE-CALCULUS
MATHEMATICS

Students are expected to know content and apply skills from Algebra II and prior math courses.

Mathematical reasoning and problem solving processes will be incorporated throughout all mathematics standards. Students will demonstrate knowledge and communicate mathematical thinking through words, numbers, symbols, charts, graphs, tables, diagrams, and models.

Objectives provide the focus for this course. They will be taught using a variety of methods and applications so that students attain a deep understanding of these concepts and are able to apply them to solve real-world problems.

The appropriate use of technological tools is encouraged to assist students in solving problems and the formation and testing of conjectures.

Standard 1: Number and Operations

Goal 1.1: Understand numbers, ways of representing numbers, relationships among numbers, and number systems.

No objectives at this course level.

Goal 1.2: Understand meanings of operations and how they relate to one another.

No objectives at this course level.

Goal 1.3: Compute fluently and make reasonable estimates.

Objective(s): By the end of Pre-Calculus, the student will be able to:

PC.1.3.1 Apply the properties of exponents and logarithms.
PC.1.3.2 Perform operations with real and complex numbers.
PC.1.3.3 Perform operations on matrices.

Standard 2: Concepts and Principles of Measurement

Goal 2.1: Understand measurable attributes of objects and the units, systems, and processes of measurement.

No objectives at this course level.

Goal 2.2: Apply appropriate techniques, tools, and formulas to determine measurements.

Objective(s): By the end of Pre-Calculus, the student will be able to:

PC.2.2.1 Compute co-terminal angles and reference angles given an angle in standard position.
PC.2.2.2 Convert between degree and radian measures.

Standard 3: Concepts and Language of Algebra and Functions

Goal 3.1: Understand patterns, relations, and functions.

Objective(s): By the end of Pre-Calculus, the student will be able to:

PC.3.1.1 Verify and simplify trigonometric identities.
PC.3.1.2 Select and use various representations for relations and functions.
PC.3.1.3 Perform transformations such as: arithmetic combinations, inverses, and compositions of functions.
PC.3.1.4 Apply the Fundamental Theorem of Algebra to determine roots of polynomial functions.

Goal 3.2: Represent and analyze mathematical situations and structures using algebraic symbols.

Objective(s): By the end of Pre-Calculus, the student will be able to:

PC.3.2.1 Write equations of circles, parabolas, and ellipses in standard form.
PC.3.2.2 Solve trigonometric equations.
PC.3.2.3 Solve exponential equations.
PC.3.2.4 Solve logarithmic equations
PC.3.2.5 Solve rational equations.
PC.3.2.6 Solve polynomial equations.
PC.3.2.7 Solve systems of linear equations.
PC.3.2.8 Solve systems of linear inequalities.
PC.3.2.9 Apply matrices to solve systems of equations.

Goal 3.3: Use mathematical models to represent and understand quantitative relationships.

Objective(s): By the end of Pre-Calculus, the student will be able to:

PC.3.3.1 Identify the domain and range of sine and cosine functions.

Goal 3.4: Analyze change in various contexts.

Objective(s): By the end of Pre-Calculus, the student will be able to:

PC.3.4.1 Apply and compare the properties of classes of functions, including polynomial, rational, exponential, and logarithmic functions.

Standard 4: Concepts and Principles of Geometry

Goal 4.1: Analyze characteristics and properties of two- and three- dimensional geometric shapes and develop mathematical arguments about geometric relationships.

Objective(s): By the end of Pre-Calculus, the student will be able to:

PC.4.1.1 Find the period and amplitude of sine and cosine functions.

Goal 4.2: Specify locations and describe spatial relationships using coordinate geometry and other representational systems.

Objective(s): By the end of Pre-Calculus, the student will be able to:

PC.4.2.1 Sketch and convert coordinates of the rectangular and polar systems.
PC.4.2.2 Draw an angle in standard position given degree or radian measure.
PC.4.2.3 Locate the quadrant in which an angle lies given its radian or degree measure.

Goal 4.3: Apply transformations and use symmetry to analyze mathematical situations.

Objective(s): By the end of Pre-Calculus, the student will be able to:

PC.4.3.1 Graph trigonometric functions of the form $y = D + A\sin(Bx)$ and $y = D + A\cos(Bx)$.

Goal 4.4: Use visualization, spatial reasoning, and geometric models to solve problems.

Objective(s): By the end of Pre-Calculus, the student will be able to:

PC.4.4.1 Apply unit circle trigonometry to determine exact values using sine, cosine, and tangent ratios.

Standard 5: Data Analysis, Probability, and Statistics

Goal 5.1: Collect, organize, and display data using a variety of formats.

Objective(s): By the end of Pre-Calculus, the student will be able to:

PC.5.1.1 Choose an experimental design or survey sampling method appropriate to collect data.
PC.5.1.2 Choose an appropriate table or graph to display data.

Goal 5.2: Select and use appropriate statistical methods to analyze data.

Objective(s): By the end of Pre-Calculus, the student will be able to:

PC.5.2.1 Identify and apply arithmetic, geometric, and infinite notation.
PC.5.2.2 Identify nth terms of arithmetic and geometric sequences.
PC.5.2.3 Find the nth term in arithmetic and geometric series.
PC.5.2.4 Find sums of arithmetic, geometric, and infinite series.
PC 5.2.5 Use Pascal's Triangle to calculate binomial coefficients.
PC 5.2.6 Use the Binomial Theorem to calculate binomial coefficients.

Goal 5.3: Develop and evaluate inferences and predictions that are based on data.

No objectives at this course level.

Goal 5.4: Understand basic concepts of probability.

No objectives at this course level.